



Machine status – December 28

- ❑ Machine status - overview
- ❑ Blue ring: ramp development
- ❑ Yellow ring: obstruction update
- ❑ Set-up and ramp-up

Hot from the press....





Machine status - overview

Yellow ring

- ✓ At operating temperature
- ✓ PS high-current tests and shut-off done yesterday

Beam activity during owl shift tuesday → obstruction (more later)

Blue ring

- ✓ almost re-commissioned for physics
(highlights and yet-to-do's later)

Injectors

longitudinal emittance

re-establish high intensity (Tandem source change yesterday
Tandem, Booster and AGS tuning)



Blue ring – set-up with beam

Established ramp with 90%+ transmission

key issues

- ❑ transition and early stone tuning (orbit, chromaticity)
- ❑ coupling control at beta* squeeze
- ❑ permit pulls: Artus re-configuring, adjusting slow loss thresholds

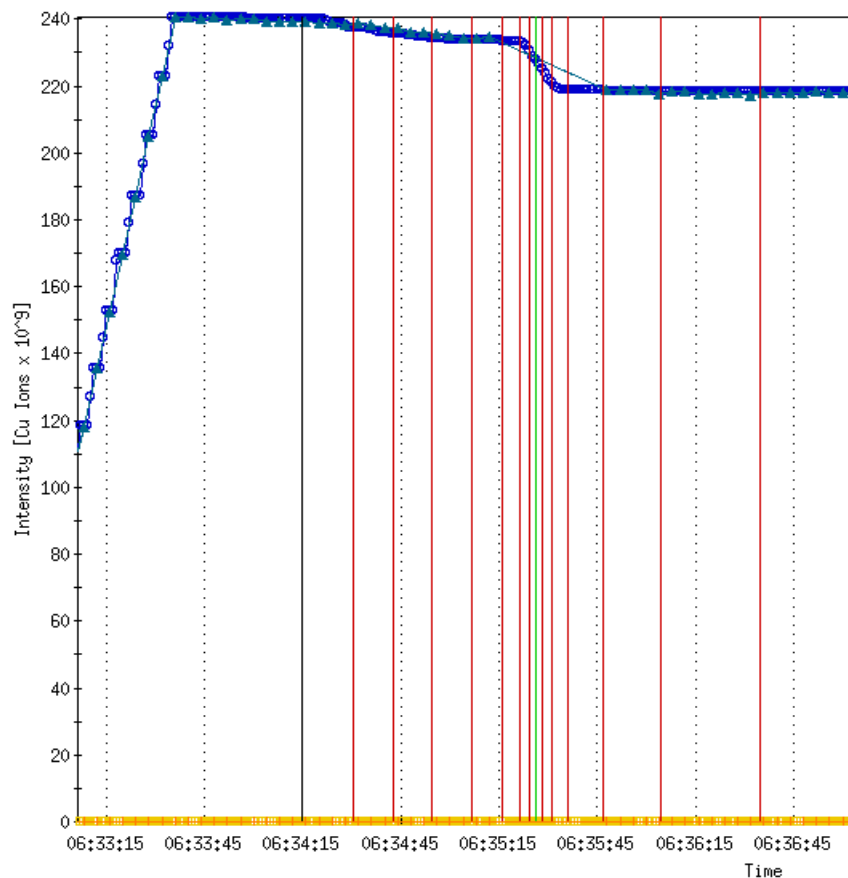
Increased intensity up to **~4e9/bunch** and
#bunches (ramped 14, 28, 45, 55 bunch
patterns, 68 at injection)

(tolerable) pressure rise at bi8, bi12, bo2



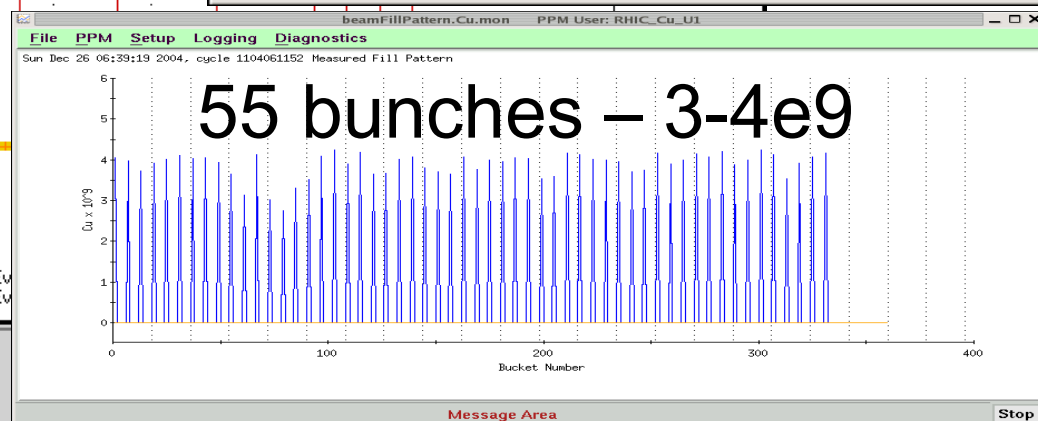
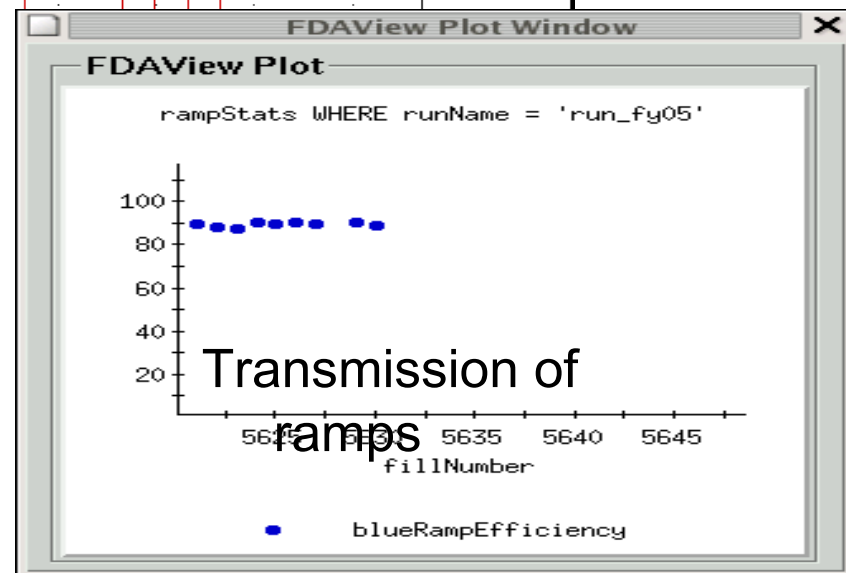
Blue ramp

Window Event



bluDCCTtotal5629;0
yelWCMbunched5629;3
relMon.ev-bganmat;relEventNumM;value5629
yelDCCTtotal5629;1
relMon.ev-accramp;relEv
relMon.ev-yganmat;relEv

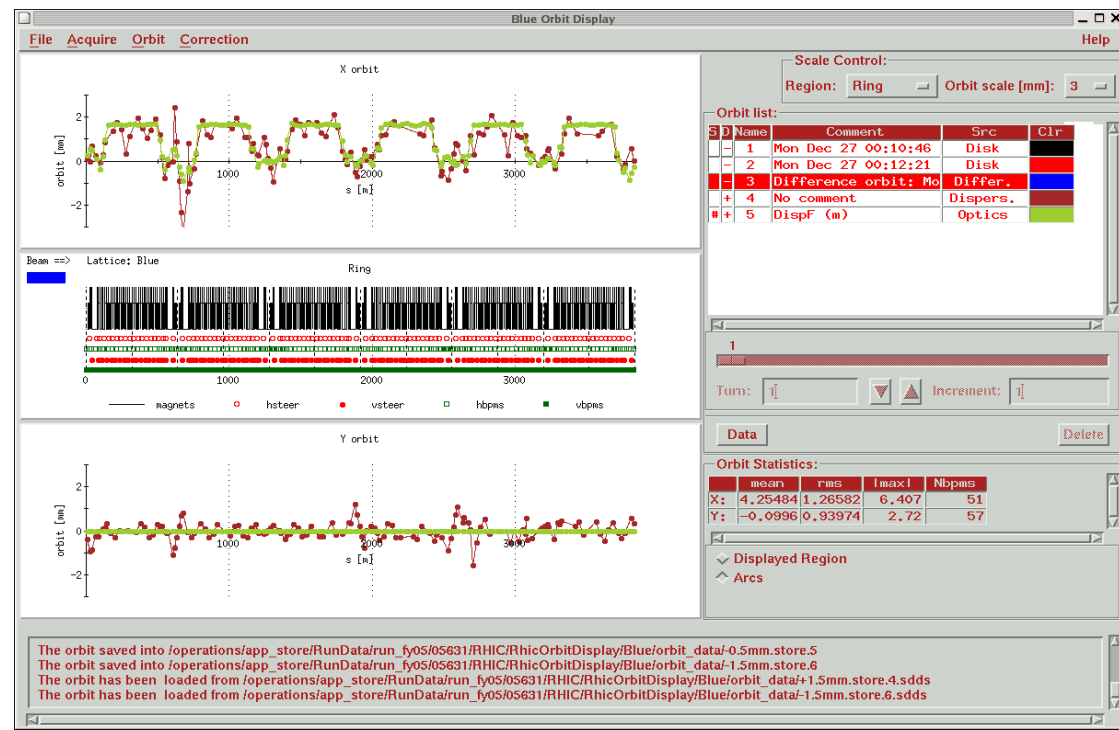
NO DATA available for relMon.ev-lumi;relEventNumM





Blue – yet to do

- ❑ High bunch intensity development ($>4e9/\text{bunch}$)
with interlock on low intensity bunches
- ❑ Re-bucketing (RF prep work done)
- ❑ Dispersion in IR8 (2m+)
- ❑ AC dipole, optics measurements





Operating scenarios

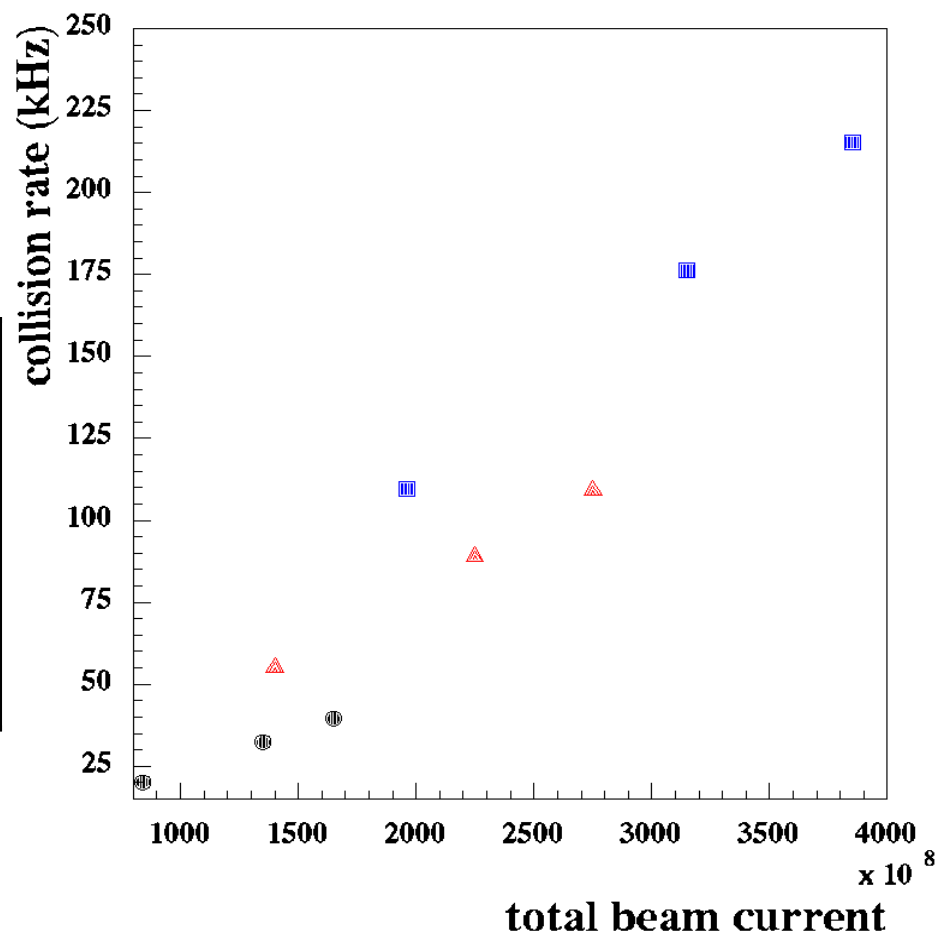
Evaluate collision and event rates for possible operating scenarios:

Number of bunches

	28	45	55
3e9	84	135	165
5e9	140	225	275
7e9	196	315	385

Bunch intensity

Phobos pressure rise?





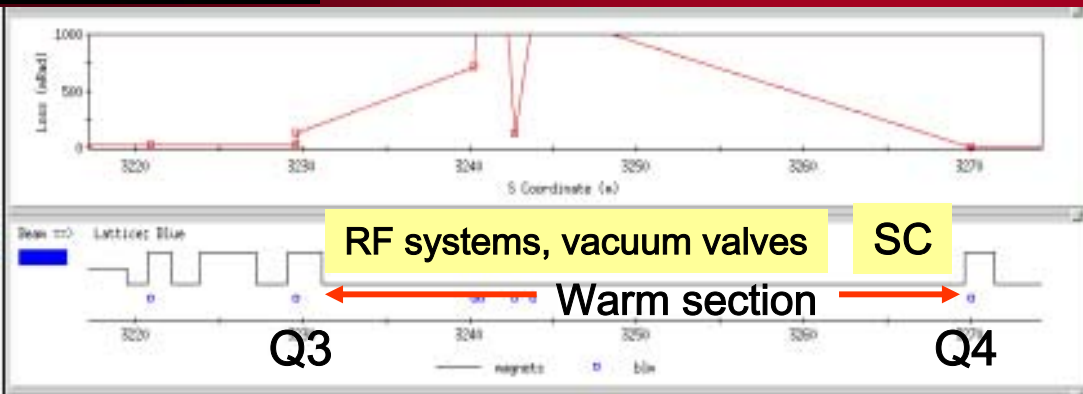
Yellow obstruction - chronicle

Tuesday 28 (owl→eve)

- ❑ Beam not circulating - ~250 turns survival – beam loses energy
- ❑ High losses in Q3-Q4 warm section, sector 4, does not respond to initial aperture scan
- ❑ Linear energy loss. Calculation (independently by 3 people) indicates that loss is consistent with ~20micron worth of material (SS or Cu) – rules out valves, bellows, RF fingers... (valve in q3-q4 functioning is checked)
- ❑ Radiation survey done radiation starts from middle of SC tank
- ❑ Install 4 new BLM's in Q3-Q4 region
- ❑ Decide to continue diagnosis with beam to better characterize the obstacle



Yellow obstruction – cont'



Radiation survey

New BLM's

Comparison with nov28 data

Check new BLM's, BPMs at SC

→confirm cause

(SC kicker? Valve? Bellow?)

→fix it

Radiation survey →

Q3	
Vac Val	20 urad
SC tank beginning	0
SC tank middle	100
SC tank end	200
SC tank just outside	250
along visible part of orange solinoid	200
at LM by solinoid	500
along covered part of solinoid	200
entrance to Landau Cavity	500
exit of Landau Cavity	400
Vac Valve	300
Along Storage Cavities	200
Exit of Storage Cavities	150
Vac Valve	300
along Acceleration Cavities	0
entrance to Vac Valve 3.1	100
exit of Vac Valve by Q3	150



Yellow obstruction – cont'

Wednesday 29 (owl→day)

- ❑ Improve injection and orbit in the machine
- ❑ Resolve configuration issues in the BLM system that confused analysis of losses, confirm that the BLM downstream SC tank is The One
- ❑ Move beam +10mm vertical and -10mm horizontal and find hole →circulating beam
- ❑ Aperture ~few mm, not enough for operating
- ❑ More work (move SC tank, jaws, etc), no sizeable improvement
- ❑ OPEN VACUUM AT SC TANK (11am today)
→ find aluminum



Fixing scenarios

Piece of aluminum foil found in the NEG pipe downstream of SC tank

From Hseuh – 8:30am today

Case 1. remove SC tank, install pipe 2days

Case 2. remove obstruction , leave SC in place

option 1: close, pump, leak check 2 days
(pressure rise)

option 2: add N2 flush to option 1 3days

Pump down today

Beam (blue) at ~6pm

Open yellow valve tomorrow ~mid day

Hopefully back with yellow beam



Impact of set-up/start-up

- Continue work with blue on owl – if possible
- Yellow set-up delay by another 2-3 days

This is still consistent with end of “2 weeks”
set-up by Jan 11 (collisions overnight)

But this assumes that repair in Sector 4 goes
according to schedule and there **NO**
FURTHER MAJOR SYSTEM PROBLEMS